plant known as *Scleria elata*, so this combination becomes necessary under the International Rules. There are apparently two well-marked varieties of this species. S. TERRESTRIS, var. **latior** (Clarke) n. comb. *S. elata*, var. *latior* Clarke in Hooker, Fl. Br. Ind. vi. 690 (1894). S. TERRESTRIS, var. **decolorans** (Clarke) n. comb. *S. elata*, var. *decolorans* Clarke l. c.

GRADUATE SCHOOL OF ARTS AND SCIENCES, *Harvard University*.

FURTHER NOTES ON BRITISH COLUMBIA ALGAE.

WM. RANDOLPH TAYLOR.

IN 1921 the writer made a camping trip through portions of the mountains of British Columbia with Dr. M. H. Jacobs, collecting algae and bryophytes as much as possible.[1] During the past season under the same leader he was able to visit other portions of this territory and to secure further collections. The party entered the Selkirk Mountains from Golden, B. C., in late August and traversed successively parts of Cañon Creek, the Spillamacheen River, Grizzly Creek and the Beaver River, passing between the first three by passes in which branches of these streams had their sources. Camps were made at various points on the North Fork of Cañon Creek giving opportunity to visit several snow fields and small glaciers feeding this stream, and to visit that fork of Grizzly Creek which headed up with the North Fork. This is an entirely different Cañon Creek from that visited in 1921 near Revelstoke. From a camp on the Spillamacheen a visit was paid to Prairie Mountain, which lies between the upper part of that stream and the Beaver River. This is a long grassy ridge, comparatively low, (6–7000 feet) with a few streams and springs which proved particularly rich. The party finally left this portion of the country at Connaught on the Canadian Pacific Railroad. A short trip was also made up the Yoho Valley at Field and another in the neighborhood of Lake Louise in Alberta, but little collecting was done on these trips. Material was secured under much the same difficulties as on the previous trip and cared for in the same way.

Instead of the rigorous weather conditions of 1921 the party in 1923 was favored with clear skies and a warm sun, so that the pools in the

[1] Taylor, W. R. Notes on some algae from British Columbia. RHODORA **24**: 101–111. 1922.

higher country only became slightly ice-coated at night. As a result the algae were in a more vigorous state, and many forms could be identified which were missed on the previous trip. Almost all the collecting was done in the open parkland and the alpine zones, that is from 5500 feet to permanent ice and snow. From lack of a barometer on this trip it is impossible to give very close approximations of the altitudes at which the different species were found. The small lakes which were at times found near the glaciers and snow patches and above the general grassland proved uniformly barren of algae which could be detected without a plankton net. The pools and rivulets in the meadowland were, however, very rich indeed, and as was found previously, very distinct in their individual floras This individuality probably largely explains the considerable differences between the forms secured on the two trips.

The small alpine bog pools generally had a scum of partly decayed *Mougeotia, Zygnema,* filamentous blue-greens and unicells, while the banks and bottoms were often coated with *Scytonema, Schizothrix* and *Nostoc.* In the flats below the glaciers a considerable growth of filamentous greens (mostly sterile *Zygnema* and *Mougeotia*) covered the glacial silt among the rocks. Lower where the water fell more rapidly the rocks were often coated with such algae as *Dichothrix* and *Amphithrix.* The former was especially notable in the Yoho Valley where in one stream in particular the rocks were entirely covered with the calcareous crust and nodules of *D. gypsophila.* A little lower in the parkland area and down the streams well into the forest *Hydrurus* covered the stones in great masses. The heavy growth of *Cladophora* which is so familiar in the eastern states appeared to be absent.

As the study of the collections of material made in 1923 was finished there came to hand a study by K. M. Ström of the alpine algae of the Sarek Mountains.[1] Based on quite extensive collections it affords interesting material for comparison with the flora in British Columbia. Plankton-net gatherings made a valuable addition to the list, which also includes some 219 desmids. Excluding desmids and peridineae he reports about 100 species, about as many as the writer has secured in British Columbia. The floras of the two districts seem to be of approximately equal richness. Undoubtedly a study in the field of living material would add greatly to these lists. Many of the forms which were abundant in British Columbia were important

[1] Ström, K. M. The algae-flora of the Sarek Mountains. Naturwissensch. Untersuch. Sarekgebirges Schwedisch-Lappland **3:** 437–521. 1923.

elements in the Sarek Mountains, as *Chroococcus turgidus*, *Merismopedia glauca*, *Nostoc commune*, *Synechococcus aeruginosus*, *Tolypothrix lanata* and *Hydrurus foetidus*. In some cases it seems that somewhat different species fill corresponding places: *Gloeocapsa magna* in British Columbia seems to replace *G. sanguinea* in the Sarek Mountains, *Scytonema myochrous* in large part replaces *S. mirabile* and *Batrachospermum moniliforme*, *B. vagum keratophytum*. On the other hand some of the algal curiosities are common to both districts: *Prasiola fluviatilis*, *Pediastrum tricornutum alpinum*.

The following are the species found in 1923:

MYXOPHYCEAE

AMPHITHRIX JANTHINA (Mont.) B. & F. Forming a dark reddish coating on rocks in Cañon Creek in the forest and in alpine rivulets near the source of Grizzly Creek. Locally abundant.

ANABAENA AFFINIS HOLSATICA Lemm.? Rivulet near summit of Prairie Mountain. Scarce

ANABAENA FLOS-AQUAE (Lyngb.) Bréb. In parkland pools of the Cañon Creek valley and in a rivulet near the summit of Prairie Mountain. Scarce.

ANABAENA INAEQUALIS (Ktz.) B. & F. In pools and among wet moss by streams, Cañon Creek and on Prairie Mountain. Frequent.

ANABAENA OSCILLARIOIDES Bory. In pools and streams, Prairie Mountain. Scarce.

APHANOCAPSA GREVILLEI (Hass.) Rich. Pools, parkland of Cañon Creek.

APHANOTHECE PALLIDA (Ktz.) Rabenh. Generally distributed; Cañon and Spillamacheen watersheds.

APHANOTHECE SAXICOLA Naeg. Pools, parkland; Prairie Mountain Cañon Creek and Spillamacheen valleys. Scarce.

CALOTHRIX PARIETINA (Naeg.) Thuret. Generally distributed; Cañon, Grizzly and Spillamacheen watersheds.

CHAMAESIPHON FUSCUM (Rost.) Hansg. With *Amphithrix* on rocks in rivulet near head of Grizzly Creek.

CHROOCOCCUS MACROCOCCUS (Ktz.) Rabenh. Parkland pools, Cañon Creek, scarce.

CHROOCOCCUS MINUTUS (Ktz.) Naeg. Generally distributed, Cañon and Spillamacheen watersheds.

CHROOCOCCUS TURGIDUS (Ktz.) Naeg, Generally distributed,

Cañon and Spillamacheen watersheds. On a flooded rock by Cañon Creek in great abundance and the major element in the association.

COELOSPHAERIUM NAEGELIANUM Unger. Pools, parkland, Cañon Creek, scarce.

COELOSPHAERIUM KUTZINGIANUM Naeg. In a spring on Prairie Mountain, scarce.

DICHOTHRIX GYPSOPHILA (Ktz.) B. & F. In a stream on the flank of Prairie Mountain, scarce; abundant in streams near Twin Falls and the Yoho River, Field.

DICHOTHRIX ORSINIANA (Ktz.) B. & F. Abundant in rivulets on the east flank of Prairie Mountain.

GLOEOCAPSA ALPINA (Naeg.) Brand. Rivulet, east side of Prairie Mountain, scarce. Among Trentepchlia and other algae, Yoho Valley, abundant.

GLOEOCAPSA MONTANA Ktz. Frequent and widely distributed. Cañon and Spillamacheen watersheds.

GLOEOTHECE FUSCO-LUTEA Naeg. In parkland pools, Cañon Creek and Prairie Mountain.

HAPALOSIPHON DELICATULUS W. & G. S. West. Among muck in pool, Parkland, Cañon Creek, scarce.

HYPHEOTHRIX CALCICOLA (Ag.) Rabenh.? On rocks and in pools, Cañon Creek and Prairie Mountain.

MERISMOPEDIA GLAUCA (Ehrb.) Naeg. Pools, parkland, Cañon Creek and Prairie Mountain, frequent in some spots.

MERISMOPEDIA PUNCTATA Meyen. Pools, parkland, Cañon Creek and Prairie Mountain, scarce.

NODULARIA HARVEYANA (Thw.) Thuret? Among moss in a pool, parkland, Cañon Creek.

NOSTOC CAERULEUM Lyngb. Among muck in parkland pool, Cañon Creek, scarce.

NOSTOC COMMUNE Vauch. Frequent and generally distributed. In Duchesnay Lake, near Field, in large masses.

NOSTOC MACROSPORUM Menegh. In red surface mud from a dried pool, parkland, Cañon Creek.

NOSTOC MICROSCOPICUM Carm. Frequent and widely distributed. Occasionally the major item in parkland pool muck.

NOSTOC PUNCTIFORME (Ktz) Hariot. In muck from banks of pools, Cañon Creek and Prairie Mountain, scarce.

OSCILLATORIA AMOENA (Ktz.) Gom. Forming a blue-green coating

on muck or stones in rivulets or among moss, lower Cañon Creek valley.

OSCILLATORIA CHALYBEA Mertens. Wet rocks and among mosses, parkland of Cañon Creek and Prairie Mountain.

OSCILLATORIA FORMOSA Bory. Wet rocks and among mosses, parkland of Cañon Creek and Prairie Mountains.

OSCILLATORIA PRINCEPS Vauch. In a parkland pool among mosses, Cañon Creek.

OSCILLATORIA SPLENDIDA Grev. In a parlkand pool among mosses, Cañon Creek.

SCHIZOTHRIX Sp.? Abundant in red surface mud from a dried pool, parkland, Cañon Creek.

SCYTONEMA MYOCHROUS (Dillw.) Ktz. The major item among moss and over bottom mud of several parkland pools in Cañon Creek valley and on Prairie Mountain. Occasional in many collections.

STIGONEMA INFORME Ktz. From the bank of a rivulet on the east side of Prairie Mountain.

STIGONEMA OCELLATUM (Dillw.) Thuret. Abundant in a few pools, parkland of Cañon Creek and the Spillamacheen.

SYNECHOCOCCUS AERUGINOSUS Naeg. Occasional in muck in parkland pools, widely distributed.

TOLYPOTHRIX LANATA (Desv.) Wartm. Occasional in muck in parkland pools, in two cases in Cañon Creek valley the major item.

TOLYPOTHRIX PENICILLATA (Ag.) Thuret. On stones in side pools of rivulets, Cañon Creek valley and on Prairie Mountain; the major element where found.

CHLOROPHYCEAE

ANKISTRODESMUS FALCATUS (Corda) Ralfs. Pools, parkland of Cañon Creek and Prairie Mountain, scarce.

ASTEROCOCCUS SUPERBUS (Cienk.) Scherffel. Pools on Prairie Mountain and in the Spillamacheen Valley, scarce.

CHAETOPHORA ELEGANS (Roth) Ag. Abundant in a watering trough by the road from Golden to Windermere.

CHAETOSPHAERIDIUM GLOBOSUM (Nordst.) Kleb. On algae in pool, parkland, Cañon Creek. Scarce.

CHLAMYDOMONAS NIVALIS (Baur) Wille.? Forming Red Snow below a ittle glacier on the west side of Cañon Creek valley. Red Snow was also seen near the head of a branch of the Spillamacheen.

COELASTRUM PROBOSCIDEUM Bohlin. Frequent in a spring on the east side of Prairie Mountain near the rocky summit.

COLEOCHAETE ORBICULARIS Pringsh. Rare in a pool in parkland, Cañon Creek.

DIMORPHOCOCCUS CORDATUS Wolle. Rare, with *Coelastrum*.

HERPOSTEIRON VERMICULOIDES (Wolle) Collins. On other algae, parkland pools, Cañon Creek, scarce

HORMOTILA MUCIGENA Borzi. Among other algae in a parkland pool, Cañon Creek, rare

OEDOGONIUM LONGATUM Ktz.? Fruiting among mosses in a pool in parkland, Cañon Creek

OOCYSTIS SOLITARIA Wille. On mud, rivulet on Prairie Mountain, rare.

OOCYSTIS SOLITARIA MAJOR Wille. In parkland pools, Cañon Creek valley and Prairie Mountain. Scarce.

PEDIASTRUM BORYANUM (Turp.) Menegh. In a spring on Prairie Mountain.

PEDIASTRUM BORYANUM LONGICORNE Racib. In pools on Cañon Creek and Prairie Mountain.

PEDIASTRUM TRICORNUTUM ALPINUM Schmidle. In a spring and pools on Prairie Mountain.

SCENEDESMUS ABUNDANS (Kirch.) Chodat. In a spring on Prairie Mountain.

SCENEDESMUS ARCUATUS Lemm. With the above.

SCENEDESMUS BIJUGA (Turp.) Lagerh. With the above.

SCENEDESMUS QUADRICAUDA (Turp.) Bréb. With the above.

SCHIZOCHLAMYS DELICATULA W. West Floating in a pool in parkland, Cañon Creek, the major item. Among mosses in another spot.

TRENTEPOHLIA AUREA (L.) Mart. On rocks near foot of Twin Falls, Yoho Valley near Field. Not noted as abundantly as on trip of 1921. It was omitted from the list in the report of that trip through an oversight.

VAUCHERIA LONGIPES Collins. On a shale bank beside Cañon Creek in parkland, abundantly fruiting.

HETEROKONTAE

OPHIOCYTIUM PARVULUM (Perty) A. Br. In pools Cañon Creek valley and on Prairie Mountain.

TRIBONEMA BOMBYCINA TENUIS Hazen. Occasional in pools in the Cañon Creek valley and on Prairie Mountain.

FLAGELLATAE

HYDRURUS FOETIDUS (Villm.) Kirchn Occasionally covering rocks in rivulets entering Cañon Creek and Grizzly Creek to the exclusion of other vegetation.

RHODOPHYCEAE

LEMANEA FUCINA Bory. A rock in a large tributary which entered the Spillamacheen from the east across Prairie Mountain from Glacier Circle was covered below the water level with a fine fruiting growth of this *Lemanea*.

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COMPOSITAE.

SONCHUS.

S. ARVENSIS L. Waste places; frequent, especially near the sea.

S. ARVENSIS L., var. GLABRESCENS Wimm. & Grab. One plant in garden for one year, Hingham (*C. H. Knowlton*, Aug. 18, 1918). Specimen in herb. C. H. Knowlton. Adventive from Europe.

S. ASPER (L.) Hill. Rich moist soil in waste places, frequent.

S. OLERACEUS L. Waste ground, rather common.

S. OLERACEUS L., forma LACERUS (Willd.) G. Beck. Dumping ground near Mt. Auburn, Cambridge (*B. L. Robinson*, Aug. 22, 1897). Specimens in herb. Gray and N. E. Botanical Club. A European waif.

TANACETUM.

T. VULGARE L. Waste places, common; especially abundant in Boston.

T. VULGARE L., var. CRISPUM DC. Persistent around old places, and spreading to waste ground, rare.

TARAXACUM.

See Earl Edward Sherff, Bot. Gaz. lxx. 329–359, 1920.